ASOS MODIFICATION NOTE 14 (for Electronics Technicians)
Engineering Division
W/OSO321:BGM

SUBJECT   :   Software Version 2.0 for Voice Processor Board 1A2A20

PURPOSE   :   To add operational enhancements for the ASOS.

EQUIPMENT AFFECTED   :   ASOS

PARTS REQUIRED   :   Microcircuit P/N 62828-45010-1
                                         Microcircuit P/N 62828-45011-1
                                         Microcircuit P/N 62828-45012-1
                                         Microcircuit P/N 62828-45013-1
                                         Microcircuit P/N 62828-45014-1
                                         Microcircuit P/N 62828-45015-1
                                         Microcircuit P/N 62828-45016-1
                                         Microcircuit P/N 62828-45017-1

MOD PROCUREMENT   :   The above parts will be provided through NLSC as ASOS
                                         Field Modification Kit (FMK) #60.
                                         ECPs E93SM05F075 and E93SM05F077

SPECIAL TOOLS   :   IC insertion tool
REQUIRED   Small flat-tipped screwdriver
                                         Conductive foam
                                         Electrostatic discharge (ESD) straps

TIME REQUIRED   :   1.5 hour

EFFECT ON OTHER   :   None.
INSTRUCTIONS

CERTIFICATION   :   This modification was tested for operational integrity
STATEMENT   in the Engineering Design Branch laboratory and sites listed
                                         in Appendix B of ASOS Modification Note 10.

GENERAL

This modification note provides instructions to upgrade the ASOS voice firmware by removing
and replacing erasable programmable read only memory (EPROM) microcircuits. The note
provides procedures for the removal and installation of the EPROM firmware. Modification
Notes 10: ACU Software Version 2.1 and 15: Port Sharing Device are to be installed in
conjunction with this modification if required.

See ASOS Modification Notes 10 and 15 in EHB-11, Section 3.6. Voice processor version 2.0
will operate correctly with ACU software version 2.1 and later. Do not install the voice processor
software version 2.0 with ACU software versions lower than 2.1

PROCEDURE

Attached are the instructions for field modification kit FMK 60. FMK 60 describes the installation of EPROMs U11, U12, U13, U14, U31, U32, U33, and U34 on the voice processor board 1A2A20.

BEFORE INSTALLING FIRMWARE

1.   Call the AOMC at 1-800-242-8194. Inform the person who answers the phone at which office you will be installing new firmware.

2.   For commissioned sites, get approval of the responsible MIC/OIC before starting installation. For non-commissioned sites, the el tech must coordinate with the site MIC/OIC before starting installation. You may install on any day of the month if permission is granted and the restrictions in steps 3 and 4 are complied with.

3.   **Commissioned Sites Only**: Do **not** start installation during bad weather, precipitation, instrument flight rule (IFR) conditions, or if any of those conditions is expected within 3 hours. These meteorological conditions will be defined by the responsible MIC/OIC.

4.   Do not start firmware installation at a time that will conflict with scheduled synoptic observations at 00, 03, 06, 09, 12, 15, 18, and 21Z.

5.   Immediately before beginning work at NWS staffed sites, the MIC/OIC/ Observer will inform the tower and any other critical users that ASOS will be shut off for firmware upgrade (unstaffed sites, the el tech will inform tower).

6.   Do not begin the installation process until immediately after an hourly observation has been transmitted. At NWS-staffed sites, normal backup observing procedures will be implemented.

7.   The system voice function will automatically broadcast "not available" message when the ACU power is turned off.

8.   Make the appropriate SYSLOG entries (MAINT-ACT-FMK) #060. Install the firmware by following the instructions in Appendix A - Instructions for FMK - ACU voice processor board firmware version upgrade.

AFTER INSTALLING FIRMWARE

9.   When ASOS is restarted at unstaffed sites, call to inform towers using CVDs and OIDs that the work is complete. (At staffed sites, the MIC/OIC observer will call the tower).

10.   If on-site NWS staff provides backup while the installation is underway, no special observation is needed when ASOS is restarted. Proceed to step 11.

        If there is no backup on site and a record observation was missed during the installation, a special observation must be taken when ASOS is restarted. The el tech should take the following steps at the ASOS keyboard after installation:

        a.   Press [SIGN].
        b.   Type his/her initials and press [RETURN].
        c.   Type the observer level password and press [RETURN].
        d.   Press [GENOB].

e. Press [SPECL].
f. Press [EXIT].
g. Press [SIGN].
h. Type his/her initials again and press [RETURN].
i. Press [RETURN] twice. This signs the "observer" off ASOS.
j. Leave ASOS running.

Note: The "observer" must sign off before the 5-minute edit time is up.

11. Inform office staff that ASOS is again operational. The chart below indicates how long it takes after start up for ASOS to report each observation element automatically.
Times Needed for Elements to be Reported Automatically

	Minimum	Maximum
Pressure	60 seconds	10 minutes
Precipitation Amount	60 seconds	*
Wind direction	2 minutes	7 minutes
Wind speed	2 minutes	7 minutes
Precipitation Type	2 minutes	*
Temperature	5 minutes	10 minutes
Dew Point	5 minutes	10 minutes
Visibility	10 minutes	15 minutes
Obstruction to Visibility	10 minutes	*
Ceiling	30 minutes	35 minutes

* Maximum time not applicable since phenomena may not be present. Minimum time applies if phenomena are present.

12. Verify that ASOS transmitted an hourly observation. Call the AOMC at 1-800-242-8194 and tell the operator:
a. Your location,
b. That installation of the new firmware has been completed, and
c. That ASOS is operational.

13. Enter in the SYSLOG that maintenance has been completed.

14. At an expansion site with ATCT, the el tech will contact ATCT and supply information on the following:
a. ASOS maintenance completed,
b. ASOS restored to service, and
c. Tower CVDs and OIDs need to be turned on, and TRACON asked to turn on their displays.

REPORTING MODIFICATION

Target date for completing this modification is 30 days after receipt of parts. Report completed modification on WS Form H-28, Engineering Progress Report, for each system per instructions in EHB-4, part 2, using reporting code ASOS.

Make appropriate entries in the SYSLOG using the Maintenance Action keys, Field Modification keys, and comment fields. Follow these steps:

1. Log on as TECH.
2. Key the MAINT screen.
3. Key the ACTION page
4. Key START - Stop here and perform the modification FMK-60. After FMK-60 is complete, log on system.
5. Key the MAINT screen.
6. Key the ACTION page.
7. Key FMK - Enter the Field Mod Kit (FMK) number as follows: <u>FMK60</u>
   On the second line of the screen verify that only **FMK60** is displayed. Complete by entering **Y** in the Y/N if only **FMK60** is displayed.
8. Check the SYSLOG and verify the FMK message. Notify the AOMC via telephone that FMK 60 is complete.

NOTE: Unused parts and the old EPROMs are to be returned to NRC as S100-FMK060OLD.

Chief, Engineering Division
J. Michael St. Clair

Attachment

W/OSO321:BGMcCormick:713-1834:3/23/94:rev.5/18/94
WP51 Files: AMOD14.H11, EHB-11 disk 11d
Spellcheck <u>sol</u> <u>5/18/94</u>

INSTRUCTIONS
FIELD MODIFICATION KIT - ACU VOICE PROCESSOR BOARD
FIRMWARE VERSION UPGRADE

1.   **UPGRADING ACU VOICE PROCESSOR BOARD FIRMWARE**

1.1 GENERAL

Digital voice processing consists of three operations: producing a verbal report based on current ASOS data from a stored vocabulary, recording an operator-generated addendum up to 90 seconds long, and producing an output consisting of the automatically generated data and the operator input. Outputs are available for the FAA handset, dial-up reports, and FAA radio communications for aircraft. Voice processing is accomplished with two dedicated boards: a Voice Processor board and a Voice Recorder/Playback board. The Voice Processor board contains the CPU for the digital voice system. It receives digital voice files from the ASOS CPU, creates voice reports consistent with the data reported by the sensors, and receives operator-generated digitized audio from the Voice Recorder/Playback board. The Voice Recorder/Playback board receives digitized voice from the Voice Processor board and converts the data into audio. Audio is output for dial-in weather requests, for the FAA handset at OID port 5C, and to an FAA transmitter for pilot use. In addition, the Voice Recorder/Playback board receives input voice audio from the FAA handset, digitizes the input audio, and transfers the digitized audio to the Voice Processor board for storage in random access memory (RAM).

1.2 FIRMWARE UPGRADE PROCEDURE

The procedure to upgrade the ACU voice firmware by removing and replacing the eight EPROMs on the Voice Processor board is followed. See Figure 1.

Step   Procedure

REMOVAL

Tools/material required:
            Small flat-tipped screwdriver
            IC insertion tool

Conductive foam

CAUTION

Damage to equipment may result if power is not removed prior to removal **or** installation. Ensure that **OUTPUT POWER** switch is set to 0 (off) position and that facility power is removed.

To avoid damage to circuit boards, use proper electrostatic discharge (ESD) handling procedures, including the use of a grounding strap, when performing the following steps.

1. Set OUTPUT POWER switch on UPS status panel to 0 (off) position. Output indicator on status panel extinguishes.

2. Remove facility power from ACU cabinet.

3. Using ASOS Site Maintenance Manual, locate circuit board to be removed.

4. When removing Voice Processor Board 1A2A20, disconnect cable from front of board by exerting outward force on cable release tabs at top and bottom of connector.

5. Using small flat-tipped screwdriver, loosen captive screws at top and bottom of board.

6. If board is equipped with extractor handles, press handles in opposite directions to release board. If board does not have extractor handles, gently rock board while exerting outward pressure and remove board from rack.

CAUTION

Throughout this procedure, discharge screwdriver before and during use by touching tool to grounded chassis surface. Failure to comply may result in damage to integrated circuits.

Step   Procedure

CAUTION

Lift integrated circuit as evenly as possible. Failure to comply may result in damage to integrated circuits.

7. From front of board, slide small flat-tipped screwdriver between integrated circuit U11 and its IC socket. Carefully pry up on U11 to lift it from socket as evenly as possible. Remove U11 from socket and place in conductive foam or on another static-free surface.

8. Repeat step 7 for integrated circuits U12, U13, U14, U31, U32, U33, and U34.

INSTALLATION

Tools/material required:

Small flat-tipped screwdriver
IC insertion tool

CAUTION

Damage to equipment may result if power is not removed prior to removal or installation. Ensure that OUTPUT POWER switch is set to 0 (off) position and facility power is removed.

To avoid damage to circuit boards, use proper ESD handling procedures, including the use of a ground strap, when performing the following steps.

1. Verify that OUTPUT POWER switch on UPS status panel is set to 0 (off) position and OUTPUT indicator on status panel is extinguished.

2. Verify that facility power is removed from ACU cabinet.

CAUTION

Throughout this procedure, discharge IC insertion tool before and during use by touching tool to grounded chassis surface. Failure to comply may result in damage to integrated circuits.

Step   Procedure

3. Using IC insertion tool, remove new EPROM integrated circuits from protective packaging and insert into Voice Processor board IC sockets in accordance with the following chart. Ensure that EPROMs are installed with pin 1 (as identified by notch in top of IC) oriented toward top of Voice Processor board as shown on Figure 1.

IC socket	IC Part number
U11	62828-45010-1
U12	62828-45011-1
U13	62828-45012-1
U14	62828-45013-1
U31	62828-45014-1
U32	62828-45015-1
U33	62828-45016-1
U34	62828-45017-1

4. Holding board by handles, position board with component side to right and carefully slide board into card rack on its guides. Align board with rear connector and press into place.

Using small flat-tipped screwdriver, tighten captive screws at top and bottom of board.

When installing Voice Processor board 1A2A20, connect cable attached to the front of board as follows:

      a.   Position connector extraction tabs to their fully extended position.

      b.   Locate cable keys and position keys to right; install cable in connector.

5.   This completes Modification Note 14. Modification Notes 10 and 15 must be completed in conjunction with this note before going to step 8.

6.   Apply facility power to ACU cabinet.

7.   Set OUTPUT POWER switch to 1 (on) position.

This completes the installation.

FIGURE 1
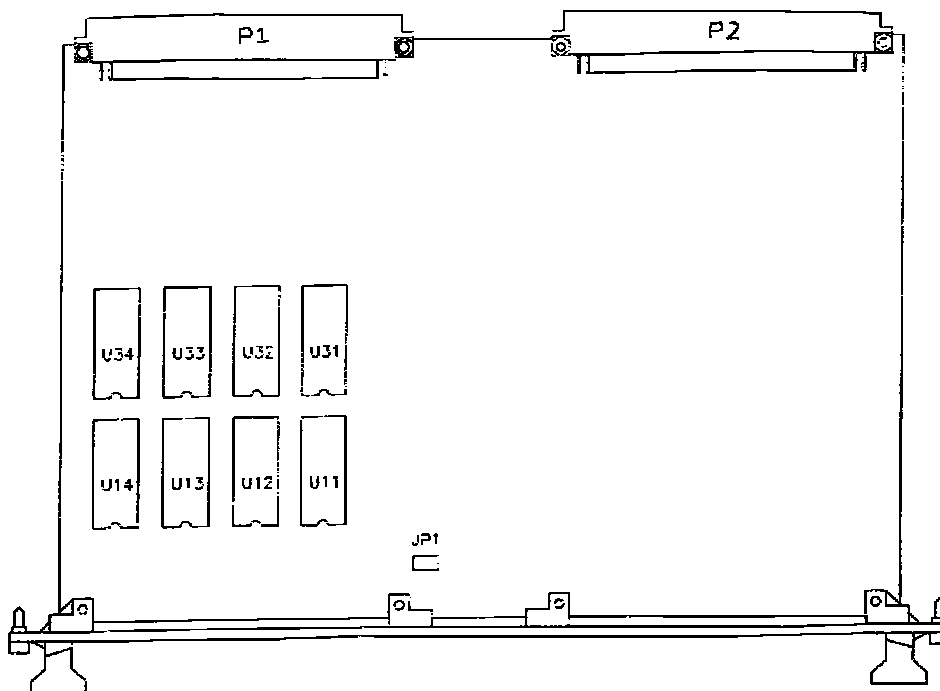
VOICE PROCESSOR BOARD 1A2A20

ASSY 62828-47018-10

ALL COMPONENTS NOT SHOWN

IC socket	IC part number
U11	62828-45010-1
U12	62828-45011-1
U13	62828-45012-1
U14	62828-45013-1
U31	62828-45014-1
U32	62828-45015-1
U33	62828-45016-1
U34	62828-45017-1